



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

[Handwritten signature]

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/879,438	06/12/2001	Michael Miettinen	442-010339-US(PAR)	3541

7590 07/21/2004
Perman & Green
425 Post Road
Fairfield, CT 06430-6232

EXAMINER

THAI, CUONG T

ART UNIT	PAPER NUMBER
----------	--------------

2173

DATE MAILED: 07/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/879,438

Applicant(s)

MIETTINEN ET AL.

Examiner

CUONG T THAI

Art Unit

2173

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on March/31/04 Amendment A.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-51 is/are pending in the application.
- 4a) Of the above claim(s) ~~17-51~~ is/are withdrawn from consideration.
- 5) ☒ Claim(s) None is/are allowed.
- 6) ☒ Claim(s) 17-51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Art Unit: 2173

FINAL ACTION

1. This action is responsive to Amendment A filed on March/31/2004.
2. Claims 17-51 are presented for examination. Claims 1-16 have been canceled.

Claim Rejections - 35 USC § 102

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claim 17-31, 38, 44-45, 47 and ~~51~~ are rejected under 35 U.S.C. 102 (e) as being anticipated by applicant submitted IDS issued to 1999 IEEE Shadow Gestures: 3D Hand Pose Estimation using a Single Camera.

As per claims 17 (method) and 24 (device), Shadow Gestures discloses a method for recognizing a selection a set of at least two alternatives as the technique of moving the thumb and the index finger (see page 484, right col., lines 1-2), the method comprising:

RB

Determining the positions corresponding to each alternative in the space surround a user on the basis of their distance and direction with respect to the user so that the locations of the positions remain substantially the same with respect to user irrespective of the location of the user is taught by Shadow Gestures as the technique of a light source to cast the shadow of a hand and use a single camera to image both the hand and its shadow. Features derived from projections of the hand and the shadow are then used to compute 3D position and orientation (see page 479, right col., lines 17-21) and the geometry of the shadow formation calculation (see page 483, left col., line 23 to right col., line 39 and see Fig. 7);

Allowing the user to carry out a first movement for moving a member of the body to a position corresponding to an alternative the user desires is taught by Shadow Gestures as the technique of user controls the robot arm by moving the thumb (see page 484, right col., line 1);

Recognizing a second movement carried out by the user in the position corresponding to the alternative the user desires is taught by Shadow Gestures as the technique of user controls the robot arm by moving the thumb and the index finger (see page 484, right col., lines 1-2);

In response to the second movement, recognizing the selection the user desires as completed is taught by Shadow Gestures as the technique of selecting simple primates from a menu and manipulating them (see page 484, left col., lines 50-51 and see Fig. 8);

Providing the recognizing selection as an output is taught by Shadow Gestures as 3D Scene in Fig. 8.

These claims are therefore rejected for the reasons as set forth above.

As per claim 45 (system), due to the mostly similarity of this claim to that of claim 17 (method), except for the system comprising: a central processing unit, a three dimensional display device, the central unit comprising communication means for communicating positions corresponding to selection alternatives to the three dimensional display device are taught by Shadow Gestures as the techniques of our system operates at 60 HZ on a SGI Indy (see page 479, right col., line 40) to compute 3D position and orientation (see page 479, right col., line 21) for the user control up to seven parameters (gripper's position, orientation and jaw-separation) by natural finger movement (see page 479, left col., lines 20-22). This claim is therefore rejected for the reasons as set forth above.

As per claims 18 (method) and 25 (device), the limitation of indicating the user at least once the positions corresponding to the alternatives as showing virtual images in each position is taught by Shadow Gestures as the technique of virtual fly-thru's over terrains (see page 484, right col., lines 7-8 and see Fig. 9). These claims are therefore rejected for the reasons as set forth above.

Art Unit: 2173

As per claims 19 (method) and 26 (device), the limitation of demonstrating the user the alternative indicated at any given time is taught by Shadow Gestures as the technique of real-time gesture recognition and hand tracking system that can be used as input interface to applications that require multi dimensional control (see page 479, left col., lines 26-29). These claims are therefore rejected for the reasons as set forth above.

As per claims 20 (method) and 27 (device), the limitation of recognizing the second movement contactlessly is taught by Shadow Gestures as the technique of virtual fly-thru's over terrains (see page 484, right col., lines 7-8 and see Fig. 9). These claims are therefore rejected for the reasons as set forth above.

As per claims 21 (method) and 28 (device), the limitation of wherein the first movement is the movement of the user's hand is taught by Shadow Gestures as the technique of user controls the robot arm by moving the thumb and the index finger (see page 484, right col., lines 1-2). These claims are therefore rejected for the reasons as set forth above.

As per claim 22 (method), the limitation of carry out the first function to the output is taught by Shadow Gestures as the technique of controlling robot arm by moving the thumb (see page 484, right col., lines 1-2 and see 3D Scene in Fig. 8). This claim is therefore rejected for the reasons as set forth above.

Art Unit: 2173

As per claim 29 (device), the limitation of carrying out a first function in response to the second movement is taught by Shadow Gestures as the technique of controlling robot arm by moving the thumb and index finger (see page 484, right col., lines 1-2 and see 3D Scene in Fig. 8).

This claim is therefore rejected for the reasons as set forth above.

As per claims 23 (method) and 30 (device), the limitation of allowing the user to carry out certain second activity with a specific third movement of the member of the body is taught by Shadow Gestures as the technique of an interface to 3D video games where users can navigate by finger-pointing. The user can also fire guns using the "click" gesture and open doors with the "reach" gesture (see page 484, right col., line 12 to page 485, left col., line 2). These claims are therefore rejected for the reason as set forth above.

As per claim 31, the limitation of recognizing the second movement carried out by the user in the position are adapted to be attached to the user is taught by Shadow Gestures as the technique of user controls the robot arm by moving the thumb and the index finger (see page 484, right col., lines 1-2) for selecting simple primates from a menu and manipulating them (see page 484, left col., lines 50-51) of 3D video games (see page 484, right col., line 13). This claim is therefore rejected for the reason as set forth above.

Art Unit: 2173

As per claims 38 (method) and 44 (device), the limitation of determining the positions corresponding to each alternative in the space surrounding a user also on the basis of their distance with respect to the user is taught by Shadow Gestures as the technique of a light source to cast the shadow of a hand and use a single camera to image both the hand and its shadow. Features derived from projections of the hand and the shadow are then used to compute 3D position and orientation (see page 479, right col., lines 17-21) and the geometry of the shadow formation calculation (see page 483, left col., line 23 to right col., line 39 and see Fig. 7). These claims are therefore rejected for the reasons as set forth above.

As per claim 47, the limitation of recognizing is a camera is taught by Shadow Gestures as the technique of we presented a one camera system that recognizes three gestures and tracks the user's hand (see page 485, left col., lines 31-32). This claim is therefore rejected for the reasons as set forth above.

As per claim 50, the limitation of wherein the three dimensional display device and the means for recognizing are comprised in the same unit is taught by Shadow Gestures as the technique of we presented a one camera system that recognizes three gestures and tracks the user's hand in 3D (see page 485, left col., lines 31-32). This claim is therefore rejected for the reasons as set forth above.

Art Unit: 2173

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 32, 46, and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over in view of applicant submitted IDS issued to 1999 IEEE Shadow Gestures: 3D Hand Pose Estimation using a Single Camera in view of Kumar et al. (USPN: 6,624,833) hereinafter Kumar.

As per claims 32 (device) and 46 (system), Shadow Gestures discloses the invention substantially as claimed above. Shadow Gestures, however, does not disclose the limitation of wherein the device comprises at least one of the following: mobile station, a computer, a television apparatus, a data network browsing device, an electronic book, and an at least partly electronically controlled vehicle.

Kumar discloses the limitation of wherein the device comprises a computer as the technique of computer system 12 (see col. 5, line 32).

It would have obvious to one having ordinary skill in the art at the time the invention was made to include Kumar's teaching of computer system into that of Shadow Gestures' invention. By doing so, the system would be enhanced by capable of connecting to a device and allowing user to select alternative choice and perform some functional tasks on virtual environment.

Art Unit: 2173

As per claim 48, Shadow Gestures discloses the invention substantially as claimed above. Shadow Gestures, however, does not disclose the limitation of wherein the means for recognizing is a shape tape.

Kumar discloses the limitation of recognizing is a shape tape as the technique of the system 10 can of course be utilizing with other types of information processing devices (see col. 5, lines 33-34).

It would have obvious to one having ordinary skill in the art at the time the invention was made to include Kumar's teaching of recognizing is a shape tape into that of shadow Gestures' invention. By doing so, the system would be enhanced by capable of allowing user to select shape tape device for recognizing and recording user movement in virtual environment.

6. Claims 33-37, 39-43 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over in view of applicant submitted IDS issued to 1999 IEEE Shadow Gestures: 3D Hand Pose Estimation using a Single Camera in view of Selker (USPN: 6,549,219).

As per claims 33 (method) and 39 (device), Shadow-Gestures discloses the invention substantially as claimed above. Shadow-Gestures, however, does not disclose the limitation of wherein the positions are sectors on an arcuate area.

Selker discloses the positions are sectors on an arcuate as the technique of a pie menu wherein highest popularity based on a historical analysis is placed in the level

Art Unit: 2173

1 circle 10. Level 2 receives a secondary menu item 20 of less importance (see col. 3, lines 39-41 and also see Fig. 1).

It would have obvious to one having ordinary skill in the art at the time the invention was made to include Selker's teaching of the positions are sectors on an arcuate area into that of shadow Gestures' invention. By doing so, the system would be enhanced by capable of allowing user to select any desired menu item in the pie menu based on user desired.

As per claims 34 (method), 40 (device), and 49 (system); Shadow-Gestures discloses the invention substantially as claimed above. Shadow-Gestures, however, does not disclose the limitation of wherein arcuate area is selection disc.

Selker discloses the limitation of wherein arcuate area is selection disc as the technique of a multiple level pie menu. As with the concentric menu system of Fig. 1, the menus are separate into multiple levels of importance. However, in this concentric level 1 is split into multiple menu selections 11, 12, 13, and 14 (see col. 3, lines 44-48 and see Fig. 2).

It would have obvious to one having ordinary skill in the art at the time the invention was made to include Selker's teaching of wherein arcuate area is selection menu disc into that of Shadow Gestures' invention. By doing so, the system would be enhanced by capable of allowing user option to select any desired menu item in the pie menu based on user desired.

Art Unit: 2173

As per claims 35 (method) and 41 (device), Shadow Gestures discloses the invention substantially as claimed above. While Shadow Gestures discloses the first movement is a substantially horizontal movement of the hand as the technique of the user stretches out the thumb (see page 484, right col., lines 8-9). Shadow Gestures, however, does not disclose the limitation of the first movement is a substantially horizontal movement of the hand to a certain sector of an arcuate area situated substantially in horizontal plane.

Selker discloses a certain sector of an arcuate area situated substantially in horizontal plane as the technique of a multiple level pie menu. As with the concentric menu system of Fig. 1, the menus are separate into multiple levels of importance. However, in this concentric level 1 is split into multiple menu selections 11, 12, 13, and 14 (see col. 3, lines 44-48 and see Fig. 2).

It would have obvious to one having ordinary skill in the art at the time the invention was made to combine Shadow Gestures' teaching of the first movement is a substantially horizontal movement of the hand into that of Selker's certain sector of pie menu arcuate area invention. By doing so, the system would be enhanced by capable of allowing user option to perform stretch out movement of the thumb and select any desired menu item in the pie menu based on user desired manner.

As per claims 36 (method) and 42 (device), Shadow Gestures discloses the invention substantially as claimed above. While Shadow Gestures discloses the second movement is a substantially vertical movement of the hand as the technique of the user

Art Unit: 2173

stretches out the thumb and the pointing finger and initiates flying by moving the hand (see page 484, right col., lines 8-10). Shadow Gestures, however, does not disclose the limitation of the second movement is a substantially vertical movement of the hand at said certain sector.

Selker discloses the limitation of certain sector as the technique of a pie menu wherein highest popularity based on a historical analysis is placed in the level 1 circle 10. Level 2 receives a secondary menu item 20 of less importance (see col. 3, lines 39-41 and also see Fig. 1).

It would have obvious to one having ordinary skill in the art at the time the invention was made to combine Shadow Gestures' teaching of the second movement is a substantially vertical movement of the hand into that of Selker's certain sector of pie menu arcuate area invention. By doing so, the system would be enhanced by capable of allowing user option to perform fly through movement of the hand and select any desired menu item in the pie menu based on user desired manner.

As per claims 37 (method) and 43 (device), Shadow Gestures discloses the invention substantially as claimed above. While Shadow Gestures discloses the second movement as the technique of the user stretches out the thumb and the pointing finger and initiates flying by moving the hand (see page 484, right col., lines 8-10). Shadow Gestures, however, does not disclose the limitation of the second movement is placing a hand into a certain position at said certain sector.

Art Unit: 2173

Selker discloses the limitation of placing a hand into a certain position at said certain sector as the technique of each menu item is selected by direct placement of a cursor over the item and activation by an input device input such as a right mouse click or double click (see col. 5, lines 6-8).

It would have obvious to one having ordinary skill in the art at the time the invention was made to combine Shadow Gestures' teaching of the second movement into that of Selker's certain sector of pie menu arcuate area invention. By doing so, the system would be enhanced by capable of allowing user option to perform second movement and select any desired menu item in the pie menu based on user desired manner.

7. Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over in view of applicant submitted IDS issued to 1999 IEEE Shadow Gestures: 3D Hand Pose Estimation using a Single Camera in view of Kumar et al. (USPN: 6,624,833) hereinafter Kumar and further in view of applicant submitted IDS issued to Tomi Engdahl, 1999: 3Dglasses and other 3D display device.

As per claim 51, Shadow Gestures-Kumar disclose the invention substantially as claimed above. Shadow Gestures-Kumar, however, do not disclose the limitation of the three dimensional display device is virtual glass.

Engdahl disclose the limitation of the three dimensional display device is virtual glass as the technique of the 3D material can be stored to any standard color video

Art Unit: 2173

media and viewed with normal display devices as long as you wear the right color filter glasses (see page 1, lines 30-31).

It would have obvious to one having ordinary skill in the art at the time the invention was made to include Engdahl's teaching of virtual 3D glass into that of Shadow Gestures-Kumar combined invention. By doing so, the system would be enhanced by capable of allowing user to use 3D virtual glasses for viewing color video media.

8. Applicants' arguments filed on March/31/2004 have been fully considered, but they are not persuasive.

On page 13, first paragraph, Applicants argues that " Shadow Gestures relates to multi-dimensional control and does not even mention different positions corresponding to different alternatives. Instead, in Shadow Gestures different fingers gestures correspond to different control commands ". The Examiner, however, does not agree to this argument since in Shadow Gestures' invention, different positions is taught as the technique of Point, Reach, Click and Ground (see page 480, left col.) corresponds up to seven parameters of gripper's position, orientation and jaw-separation (see page 479, left col.), this seven parameters of gripper's position, orientation and jaw-separation correspond to different alternative based on user's movement activities.

On page 13, second paragraph, Applicants agree that " Shadow Gestures does not teach recognizing user's selection on the basis of a second movement or that a

Art Unit: 2173

second movement is done in the position corresponding to the desired alternative.

Instead, Shadow Gestures recognizes control commands on the basis of finger gestures, and no sequence of movements, wherein the second movement is done in the position corresponding to the desired alternative.” The Examiner, however, does not agree to this argument since in Shadow Gestures’ invention, the second movement and the sequence of movement are taught as the technique of user controls the robot arm by moving the thumb and the index finger (see page 484, right col., lines 1-2), the user stretches out the thumb and the pointing finger and initiates flying by moving the hand (see page 484, right col., lines 8-10). Thus by moving the index finger and initiate consequence of flying the hand, the user can control of hand and arm movement in virtual three-dimensional environment.

On page 13, third paragraph, Applicants agree that “the method of claim 17 allows the use of rough hand and arm movements in making a selection”. The Examiner, however, does not agree to this argument since the feature of “allows the use of rough hand and arm movements in making a selection” is taught by Shadow Gestures as the technique of user controls the robot arm by moving the thumb and the index finger (see page 484, right col., lines 1-2), the user stretches out the thumb and the pointing finger and initiates flying by moving the hand (see page 484, right col., lines 8-10).

On page 13, fourth paragraph, Applicants agree that “ Claims 24 and 45 have similar limitations in structure form.” The Examiner, however, does not agree to this argument. These claims are rejected for the same reasons applied to claim 17.

Art Unit: 2173

On page 13, fifth paragraph, Applicants agree that " Thus claims 17-31, 33-45, and 47-51 define over Shadow Gestures. Further since the above features are not suggested by this reference, these claims are unobvious over it". The Examiner, however, does not agree to this argument. Claims 17-31, 33-45, and 47-51 are rejected for at least of the same reasons based on Shadow Gestures as set forth above.

On the last paragraph of page 13, Applicants agree that " Kumar fails to disclose the above features. Thus combining it with Shadow Gestures does not result in the claimed invention. Thus claims 32 and 46 are unobvious under 35 USC 103 on this reference combination.". The Examiner, however, does not agree to this argument since as indicated by the Examiner: Shadow Gestures does not disclose the limitation of wherein the device comprises at least one of the following: mobile station, a computer, a television apparatus, a data network browsing device, an electronic book, and an at least partly electronically controlled vehicle.

Kumar discloses the limitation of wherein the device comprises a computer as the technique of computer system 12 (see col. 5, line 32).

It would have obvious to one having ordinary skill in the art at the time the invention was made to include Kumar's teaching of computer system into that of Shadow Gestures' invention. By doing so, the system would be enhanced by capable of connecting and communicating to a device and allowing user to select alternative choice and perform some functional tasks on virtual environment.

Art Unit: 2173

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CUONG T THAI whose telephone number is (703) 308-7234. The examiner can normally be reached on 8:00 am - 4:00 pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John W. Cabeca can be reached on (703) 308-3116. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2173

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CUONG T THAI
Examiner
Art Unit 2173

July/08/2004.


RAYMOND J. BAYERL
PRIMARY EXAMINER
ART UNIT 2173